Abstracts

Gregory L. Moneta, MD, Section Editor

Analysis of Infection Risk Following Covered Stent Exclusion of Pseudoaneurysms in Prosthetic Arteriovenous Hemodialysis Access Grafts

Kim CY, Guevara CJ, Engstrom BI, et al. J Vasc Interv Radiol 2012;23: 69-74

Conclusion: Covered stent exclusion of intragraft dialysis access graft pseudoaneurysms is correlated with a high rate of eventual graft infection.

Summary: Prosthetic arteriovenous (AV) grafts are prone to develop pseudoaneurysms that are thought related to graft material degeneration secondary to repeated cannulation at specific sites. Such pseudoaneurysms may be particularly prone to develop infection in the face of outflow obstruction. Endovascular treatment can be used to treat prosthetic AV graft pseudoaneurysms with reports of high technical success and acceptable patency rates (Vesely TM, J Vasc Interv Radiol 2005;16:1301-7; Najibi S et al, J Surg Res 2002;106:15-19). However, the authors of this report indicated an anecdotal impression that incorporating this technique into their practice resulted in a higher incidence of prosthetic AV graft infection. They therefore sought to study whether stent graft treatment of prosthetic AV graft pseudoaneurysms influenced the incidence of AV graft infection. The authors reviewed their interventional radiology database for prosthetic AV graft interventions involving stent deployment anywhere within the AV graft and found 235 interventions in 174 patients between November 2004 and December 2008. The incidence of AV graft infection was analyzed by stent type (bare metal vs covered), location, and indication for stent deployment on a per-stent, per-procedure, and per-graft basis. Eventually, 16.3% of AV grafts with stents implanted required surgical excision for graft infection. When covered stents were used to treat intragraft pseudoaneurysms, the subsequent rate of graft infection increased compared with bare-metal stents or covered stents deployed within the graft for other reasons (42.1% vs 18.2%, $P = .011$). When stents were deployed at an intragraft location, there was a higher incidence of graft infection compared with those deployed at a venous anastomosis or in an outflow vein (26.9% vs 6.9%, $P < .001$).

Comment: Pseudoaneurysms of prosthetic dialysis grafts are usually associated with a history of repeated punctures at the site where the pseudoaneurysm developed. More punctures in a specific site will likely increase the risk of contamination, and the more the risk of contamination the more the risk of infection. It follows, as shown here, that placing an additional prosthetic under such circumstances is not likely to have favorable outcomes.

Cognition After Carotid Endarterectomy or Stenting: A Randomized Comparison

Altinbas A, van Zandvoort MJ, van den Berg E, et al. Neurology 2011;77: 1084-90.

Conclusion: Despite a substantially higher rate of new ischemic lesions after carotid artery stenting (CAS) compared with carotid endarterectomy (CEA), changes in cognition after CAS or CEA are not statically significant.

Summary: Diffusion-weighted (DWI) magnetic resonance imaging (MRI) shows there is a three times incidence of new ischemic lesions after CAS compared with CEA (Schnaudigel S et al, Stroke 2008;39:1911-9). In elderly people, free of dementia and baseline stroke, "silent" infarcts more than double the risk of dementia and are related to a steeper decline in cognitive function (Vermeer SE et al, N Engl J Med 2003;348:1215-22). This study compares effects on cognition of CAS and CEA in patients with symptomatic carotid artery stenosis. A secondary goal was to compare the occurrence of new cerebral ischemic lesions on DWI-MRI in CAS and CEA patients. Patients were derived from two specific participating centers of the International Carotid Stenting Study (ICSS). Patients in these centers underwent detailed neuropsychologic examinations before and 6 months after CEA or CAS revascularization. DWI was performed before the revascularization procedure and ≤3 days after revascularization. Patients underwent cognitive testing, and results were standardized into z scores. From this a cognitive sumscore was calculated. The primary outcome end points were changes in cognitive sumscores between baseline and follow-up in CAS and CEA patients. ICSS included 1,713 patients. The two centers that participated in this study enrolled 177 patients. Of the 177 patients, 140 had a neuropsychologic examination (NPE) at baseline and 120 had an NPE at follow-up. CAS was associated with a larger decrease in cognition than CE,.but between-group differences were not statistically significant (−0.17, 95% confidence interval, −0.38 to 0.03; $P = .092$). There were 89 patients who had a pretreatment MRI and 64 who had a MRI ≤3 days after revascularization with CAS or CEA. New ischemic lesions were found twice as often after CAS than after CEA (relative risk, 2.1; 95% confidence interval, 1.0-4.4; $P = .041$).

Comment: The effect on cognition of carotid interventions is coming under increased scrutiny, but prospective data are currently very limited. This study found a very small decline in cognitive function in patients undergoing CAS for symptomatic carotid stenosis but not in patients undergoing CEA for symptomatic carotid stenosis. It is tempting to relate this to higher numbers of DWI lesions observed after CAS vs those observed after CEA, but no regression analysis was performed, nor is it likely, given the relatively small number of patients involved vs the small observed effect and unmeasured confounders such as the location of the infarcts, that a regression analysis would establish a correlation between number of DWI infarcts and postprocedure cognitive decline.

Sirolimus-Eluting Stents vs. Bare-Metal Stents for Treatment of Focal Lesions in Infrapopliteal Arteries: A Double-Blind, Multi-Centre, Randomized Clinical Trial

Rastan A, Tepe G, Krankenberg H, et al. Eur Heart J 2011;32:2274-81.

Conclusion: Stent treatment of focal infrapopliteal arterial lesions can be improved with the use of sirolimus-eluting stents compared with bare-metal stents.

Summary: Below the knee balloon angioplasty is the mainstay of endovascular treatment of infrapopliteal disease. Stents are generally placed only after suboptimal results with angioplasty alone. The success of drug-eluting stents for treatment of coronary arteries has led to interest in using drug eluting stents to treat atherosclerotic lesions in infrapopliteal arteries. The authors conducted a prospective, randomized, multicenter, double-blind trial comparing polymer-free sirolimus-eluting stents with a placebo-coated bare-metal stent in 161 patients with intermittent claudication or critical limb ischemia and a primary infrapopliteal atherosclerotic lesion. The mean target lesion length was 31 ± 9 mm. The main end point was the 1-year primary patency rate, defined as freedom from in-stent restenosis (luminal narrowing of ≥50%) detected with duplex ultrasound imaging or with angiography if duplex was nondiagnostic or not technically feasible. Secondary end points included 6-month primary patency rates, secondary patency rates, and changes in the Rutherford classification system after 1 year. During follow-up, 25 patients (15.5%) died, and 125 patients reached the 1-year examination point. Primary patency at 1 year was higher in the sirolimus-eluting stent group (80.6%) than in the bare-metal stent group (55.6%; $P = .004$). Secondary patency rates at 1 year were 91.9% and 71.4%, respectively ($P = .005$). Median (interquartile range) change in Rutherford classification after 1 year was −2 (−3 to −1) in the sirolimus-eluting stent group and −1 (−2 to 0) in the bare-metal stent group ($P = .004$). Event-free survival, defined as survival free from target lesions revascularization, major and minor amputation, myocardial infarction, and death, was no different between the two groups at 12 months ($P = .2$).

Comment: It does not follow that because drug-eluting stents have purported advantages in the coronary circulation that they will also be useful in small peripheral arteries. After all, the coronary and tibial circulations have entirely different flow dynamics, and intimal hyperplasia and atherosclerosis seem to be influenced by patterns of shear stress. Therefore, studies such as this are necessary to evaluate potential useful translation of technology from one vascular bed to another. Determining clinical utility is another matter. Half the patients in this series were treated for claudication. The very large majority of patients with claudication are not going to significantly benefit from endovascular treatment of an isolated, short tibial artery stenosis or occlusion.

A Propensity Score-Matched Comparison of Deep vs Mild Hypothermia During Thoracoabdominal Aortic Surgery

Weiss AJ, Lin H-M, Bischoff MS, et al. J Thorac Cardiovasc Surg 2012;143: 186-93

Conclusion: Deep hypothermic circulatory arrest (DHCA) results in improved postoperative adverse outcome rates compared with non-DHCA techniques in the repair of descending thoracic aortic (DTA) and thoracoabdominal aortic aneurysms (TAAA).

Summary: DTAs and TAAAs are often treated with open surgery. Several adjunctive perfusion techniques are used with open repair of TAAAs and DTAs. These include no distal perfusion (clamp and sew), mild hyperthermia with atrial-femoral or femoral-femoral bypass, and DHCA. DHCA for DTA and TAAA repair is, however, largely restricted to high-volume centers and used selectively. In this study, the authors compared outcomes of DHCA with non-DHCA techniques for complex repairs of the distal thoracic aorta. They examined the effect of distal ischemic time and temper-